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10/677,257	10/03/2003	Satoshi Inoue	039282.03	9107
25944	7590	05/18/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			TRINH, MICHAEL MANH	
			ART UNIT	PAPER NUMBER
			2822	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/677,257

Applicant(s)

INOUE, SATOSHI

Examiner

Michael Trinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 8-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10-03-2003</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

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## DETAILED ACTION

\*\*\* This office action is in response to Applicant's election and amendment filed on February 28, 2005. Claims 1-7 were canceled. Claims 8-20 are newly added.

### *Election/Restrictions*

1. Applicant's election filed February 28, 2005 of Species I, Figures 2A-3D, corresponding to method claim 1, with traverse, is acknowledged. The traversal is on the ground(s) that "...search for the subject matter of any one species would encompass a search for the subject matter of the remaining species. Thus,...search and examination of the entire application could be made without serious burden...". This is not found persuasive because these inventions are species and distinct for reasons and given example(s) as of record and have acquired a separate status, in which the fields of search are not co-extensive and separate examination would be required for these distinct inventions, and because Applicant did not even contravene the supposed errors of the given examples, and/or did not distinctly and specifically point out the supposed errors of the examples in the restriction requirement. Accordingly, examination, searching, and considering patentability of all of these multiple distinct species invention would be a very serious burden to the examiner. Because these species inventions are distinct for the reasons given above, the field of search are not co-extensive and separate examination would be required, restriction for examination purposes as indicated is proper. Moreover, should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 2-7 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

\* Claims 2-7 and 1 were also canceled by Applicant. New claims 8-20 have been added.

***Claim Rejections - 35 USC § 112***

3. Claims 8-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 16, it is unclear and indefinite as claim 16 recites “none of the source and drain electrode being connected to the first region” but “the source electrode being connected to the first region”. Apparently, it should be --the source electrode being connected to the third region--.

Claim 13 recites “...the first region being separated into a first part and a second part,...the first part being located between the first region and the channel region...”. Meaning and scope of claim 13 are unclear and indefinite, since the first part is located between it self as the first region.

Re claims 8-20: Specification page 12, at paragraph 0063, describes “a source region 17” as a first region, “a drain region 18” as a second region; and, at paragraph 0064, “diffused regions 23” as a third region. However, in base claim 8, a first region appears to be the diffused region 23 (not “source region” as described in the specification), a second region appears to be the source region, and a third region appears to be the drain region. Thus, in light of the specification, meaning and scope of the claims are unclear and indefinite as claimed terms are inconsistent and not corresponding with the terms defined in the specification.

(Dependent claims are also rejected as depending on rejected indefinite base claim)

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who

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has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 8,14,16 are rejected under 35 U.S.C. 102(b) as being anticipated by Maeguchi (4,463,492).

Re claim 8, Maeguchi teaches a method for forming a transistor comprising: preparing a substrate 1; forming a semiconductor film 2 on the substrate (Figs 2-3; col 3, lines 27-44); forming a first region 4,9 in the semiconductor film by applying a first impurity atom to the semiconductor film 2 (Figs 5,9,10; col 4, lines 28-51; col 3, line 46 through col 6); forming an insulator film 3 over the semiconductor film; forming a gate electrode 5 over the insulator film (Fig 7; col 4, lines 52-59); and forming a second region 7 and a third region 8 in the semiconductor film by applying a second impurity atom to the semiconductor film after the forming of the p+ first region 9; the second and the third region being separated by the first region 9, and the first impurity atom and the second impurity atom being different (Figs 9-11; col 5, line 3 through col 6). Re claim 14, wherein the gate electrode 5 is used as a mask to apply the second impurity atom (Figs 7-10; col 4, line 52 through col 5). Re claim 16, wherein the method further comprises forming a source electrode 10 and a drain electrode 11, the source electrode 10 being connected to the first region 7 (sic, third region 7), the drain electrode 11 being connected to the second region 8, and none of the source and the drain electrode 10/11 being connected to the first region 9.

6. Claims 8,14-17,19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki (5,514,879).

Re claim 8, Yamazaki teaches a method for forming a transistor comprising: preparing a substrate 11; forming a semiconductor film 3 on the substrate (Figs 7A-7F; col 7, line 24 through col 8); forming a first region in the semiconductor film by applying a first impurity atom to the semiconductor film 33 through openings 26',26 (Fig 7A, col 7, lines 25-50); forming an insulator film 35 over the semiconductor film; forming a gate electrode 40',40 over the insulator film (Fig 7B; col 8, lines 27-58); and forming a second region 34a',34a and a third region 34b',34b in the semiconductor film by applying a second impurity atom to the semiconductor film after the forming of the first region (col 8, line 59 through col 9); the second region and the third region

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being separated by the first region, and the first impurity atom and the second impurity atom being different. Re claim 15, the method comprises applying an energy to the semiconductor film to crystallize the film (col 7, lines 52-65; Fig 7A) before forming the third region 34a,34b (Figs 7C-7D; col 8, line 59+). Re claim 14, wherein the gate electrode 40',40 is used as a mask to apply the second impurity atom (Figs 7C-7D; col 8, line 59 through col 9, line 15). Re claim 16, wherein the method further comprises forming a source electrode 36a',36a and a drain electrode 36b,36b', the source electrode being connected to the first (sic, third) region 34b', the drain electrode being connected to the second region 34a', and none of the source and the drain electrode 36 being connected to the first region (Fig 7F; col 9, lines 30-52). Re claims 17,19-20, wherein the method is used for manufacturing an active-matrix liquid crystal display substrate, a display device, and an electronic apparatus (col 1, lines 21-30; col 4, lines 1-5; and col 13, line 62 through col 14, line 9).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeguchi (4,463,492) taken with Kawashima et al (5,016,986).

Maeguchi teaches a method for forming a transistor as applied to claims 8,14, and 16 above.

Re claims 17-20, Maeguchi already teaches the method of manufacturing the transistor, but lacks using the method for manufacturing an active matrix substrate (claim 17), an electroluminescent device (claim 18), display device (claim 19), and an electronic apparatus (claim 20).

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However, Kawashima teaches (at col 10, lines 60-68) applying the method in manufacturing a liquid crystal display as active matrix substrate (claim 17) and other devices including a plasma display device (re claim 19), an electroluminescence display device (claim 18), and electronic devices (claim 20).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the method of manufacturing the transistor of Maeguchi in manufacturing other devices including the active matrix substrate as liquid crystal display, the electroluminescence display device, the plasma display device, and the electronic devices, as taught by Kawashima. This is because of the desirability to manufacture different and various types of devices by using transistors having high speed operation with lower power consumption.

9. Claims 8-14,16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (5,605,855) taken with Hsu (4,232,327).

Chang et al teaches a method for forming a transistor comprising: preparing a semiconductor substrate film 10; forming a first region 24/22 in the semiconductor film by applying a first impurity atom to the semiconductor film 10 (Fig 2A, col 3, line 46 through col 4, line 49); forming an insulator film 12 over the semiconductor substrate film 10; forming a gate electrode 34 over the insulator film 12 (Figs 3-5; col 5, lines 53-67); and forming a second region 36 and a third region 38 in the semiconductor film by applying a second impurity atom to the semiconductor film after the forming of the first region 24/22 (Figs 5A-5B; col 5, line 53 through col 6, line 36); the second region 36 and the third region 38 being separated by the first region 22/24, and the first impurity atom and the second impurity atom being different. Re claim 9, wherein the semiconductor substrate film 10 having a channel region under the gate electrode 34, the channel region between the first region 24 and regions 36/38 is not including any of the first impurity atom of the first region 24 and the second impurity atom of the second and third regions 36/38. (Figs 5A-5B). Re claim 10, wherein the first region 24/22 is located inside the channel region under the gate electrode 34 (Figs 5A-5B). Re claim 11, wherein the first region is separated into a plurality of portions 24 and 22 (Figs 5A-5B). Re claim 12, wherein a part of the

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first region 22 is protruded to the second region 36 and the third region 38 from the channel region under the gate electrode 34 (Fig 5A). Re claim 13, insofar as understood, the first region 22/24 being separated into a first part and a second part by the channel region, the first part being located between the first region and the channel region, and the second part 24 being located between the second region 36 and the channel region (Fig 5A). Re claim 14, wherein the gate electrode 34 is used as a mask to apply the second impurity atom (Fig 5A; col 5, line 57 through col 6, line 35).

Chang teaches forming the transistor in a bulk silicon substrate 10, while claim 8 recites forming a semiconductor film on a substrate.

However, Hsu teaches (at col 1, line 65 through col 1, line 10; col 2, line 25 through col 3) using the inventive method to form a transistor in either a bulk silicon substrate 11 (Figs 1B to 6B; col 3, line 26 through col 4) or to form a transistor in a semiconductor film 12 formed on a substrate 10 of sapphire (Figs 1A to 6A; col 2, line 23 -67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the transistor of Chang in a semiconductor film formed on a substrate as taught by Hsu. This is because of the desirability to form a silicon-on-sapphire device having a transistor comprising thinner film semiconductor body.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-16

  
Michael Trinh  
Primary Examiner





18/33

Approved  
m.f.

FIG. 18A

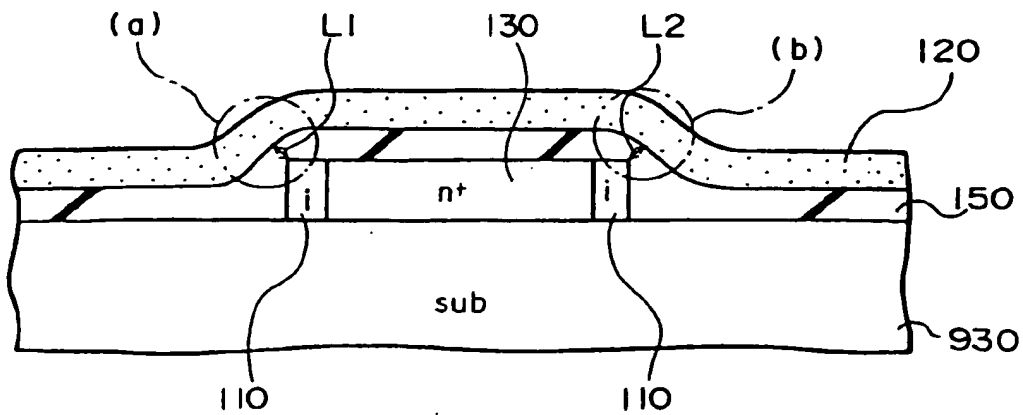


FIG. 18B

